

TITLE OF INVENTION

A Portable Ambulatory Assist Rail Ramp System has been invented by Vicky Louise Grody, a United States citizen, residing at 183 Robert Hensley Road, Hohenwald, Tennessee, 38462-5653, with a correspondence customer number of 25961, application number of 60/245,275. This specification for a non-provisional utility patent under small entity status has a total of 12 pages followed by a total of 5 drawing sheets.

CROSS-REFERENCE TO RELATED APPLICATIONS

U.S. Patent Documents

US5435028	Jul., 1995	Frala	005/662
US5231721	Aug., 1993	Fish	005/662
US5257426	Nov., 1993	Leoutsakos	005/503.1
US4279043	July., 1981	Saunders	005/81.1RP
US3911509	Oct., 1975	Fleckenstein	005/507.1
US5354022	Oct., 1994	Coonrod	248/127
US5347666	Sep., 1994	Kippes	005/81.1R
US5507044	Apr., 1996	Williamson, et al.	005/81.1RP
US5579864	Dec., 1996	Shorrock	182/113
US4550802	Nov., 1985	Roper	182/113

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

Not Applicable

REFERENCE TO A MICROFICHE APPENDIX

Not Applicable

BACKGROUND OF INVENTION

This present invention relates to devices of self-help support for the purpose of aiding a user to position themselves prone, lateral, supine, or sitting on any horizontal or recumbent surface.

The designs of devices intended to receive the human body such as examination tables, radiographic tables, operating room beds, stretchers, or hospital beds do not promote adequate safety or physical independence for an ambulatory individual because substantial rail support is generally not available and because the horizontal or recumbent surface of such devices are generally at a height not amenable to mounting unless an assisting product like a footstool is made available.

The prior art discloses a number of support devices, transfer stands, footstools and step up devices with or without rails and with or without ramps to assist disabled or physically impaired individuals to transfer from one location or from one elevation to another. For example U.S. Pat. No. 4550802 discloses a four-legged footstool with a removable incline ramp and a single removable handrail that can be positioned on the left or right. U.S. Pat. No. 5579864 discloses a four-legged step up platform with folding handrail. U.S. Pat. No. 4279043 discloses a portable and rotatable transfer stand. U.S. Pat. No. 534766 discloses a transfer aid to assist users to rise from a sitting position. U.S. Pat. No. 5507044 discloses flat base rotating platform with an upright pole terminating at a pair of handles. U.S. Pat. No. 5,347,666 discloses a lightweight portable device user clutches and pulls on to rise from a seated position. All the aforementioned devices place an assistant either at arm's length from the user or at a different elevation from the user. U.S.

Pat. No. 5435028 discloses a detachable bed frame support rail. U.S. Pat. No. 5232721 discloses a removable bedside grab bar post.

The current commercial devices, used to assist in transferring individuals from one location or one elevation to another, are proportioned for a single user and the weight capacity and stability of such devices varies with product materials. Those products that assist a user in changing elevation do not accommodate an assisting individual such as an orderly, aide, nurse, or household member thus the assisting individual is at a different elevation from the user and generally acts as rail support to advance the user's change in position or elevation. For those products that do provide substantial upright rail support such as the bedside grab bar or detachable bed frame rail there is degradation in device flexibility in that they have a single purpose namely to reposition from a hospital bed. These devices because of their design cannot be used in a location other than at bedside and they cannot be used with other pieces of equipment such as examination tables.

Low back injuries and disability has occurred among health care workers when assisting others who are ambulatory but experience limited movement of their limbs, physical instability or reduced strength. The two most important risk factors for such occupational injuries include the weight of a patient and the distance a health care worker is from a patient. Even a slight difference in elevation between a patient and a healthcare worker can promulgate forces that result in lower back injury to either party.

Given the need to have devices for aiding a user to mount beds, tables, and chairs one object of this invention is to provide a low profile wide based stable incline surface approachable by users with physical limitations and concurrently approachable by individuals assisting the user.

It is further an object of this invention to provide a portable stand alone external source of rail support to promote user independence and designed such that a user's full weight bearing can be supported solely by a rail.

It is another object of this invention to provide rail support configuration flexibility for a healthcare worker or household member when assisting a user of the device such that the worker or member can approximate himself or herself as close as desired to the user.

SUMMARY OF INVENTION

The foregoing objects and advantages of the invention are achieved through the use of an incline ramp and substantial upright support rails that can be removed and reversed. In accordance with one embodiment of the invention, the incline ramp with enclosed front, sides and back sets on a floor surface, and is of sufficient width to accommodate two human bodies. The rail ramp system is transported via swivel type casters and once at a desired location the wheels are disengaged by the use of a foot pedal mechanism. The rails are one and half inch rounded upright support structures held into place on either side of the incline ramp by a pair of corresponding rail sleeves with the shorter front sleeve having accommodations for a ring type grip retaining pin. The eight rail sleeves are flush with the surface and bottom of the incline ramp to advance the unit's stability and the sleeves have a circular opening at the bottom to promote cleaning and disinfecting of the unit. The sleeves are designed so that no amount of lateral movement or pressure will dislodge the rails. Only an upward motion will remove the rails from their holders after the retaining pin has been removed from the front sleeve. In accordance with another embodiment of the invention, the rail supports have a rounded configuration extending beyond one of the plumb uprights such that the distal horizontal point of

the rounded configuration, when the rail is positioned forward, aligns vertically with the front of the ramp. When the rail is placed in a reversed position, the distal horizontal point of the rounded configuration extends beyond the back end of the ramp. The rail and rail sleeves provide configuration flexibility such that the rails can be positioned on either side of the incline ramp and in a forward or reversed position for easy grasping by the user without overextending arm reach.

In using the incline ramp, a user and assisting individual gradually move up the ramp to a desired level that facilitates mounting a horizontal or recumbent surface. The user must be ambulatory in that he or she has control and use of at least one lower extremity and said user being capable of using at least one upper extremities to pull them self to their feet or foot.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of the invention depicting an incline ramp with non-skid surface material, eight rail sleeves and a pair of rails positioned forward.

FIG. 2 is a perspective view of a rail.

FIG. 3 is a perspective view of a front set of rail sleeves with a portion of rail and retaining pin.

FIG. 4 is a perspective view of the incline ramp with a foot actuation mechanism.

FIG. 5 is a perspective view of the caster plate, a pair of caster wheels, two pair of rail sleeves, and a foot actuation mechanism in the depressed or lower mode.

DETAILED DESCRIPTION OF THE INVENTION

Turning now to the Figures, wherein like reference numerals indicate like elements, FIG. 1 is a perspective view to illustrate different embodiments of the portable ambulatory assist rail ramp system of the present invention. 1 the incline

ramp with the highest portion being referred to as the back side, 2 a pair of rails with the protruding configuration shown in the forward position, 3 a set of back rail sleeves, 4 a set of front rail sleeves, 6 non-skid material covering the surface of the incline ramp, 7 a foot actuation mechanism also referred to as a foot pedal, and 9 a hole to receive a retaining pin.

Incline ramp 1 is covered on all four sides with the front side being 0.35 inches in height and the backside being 11.71 inches in height resulting in an 18.96 degree rise in incline. The width of the incline ramp surface is 28 inches with a depth of 28 inches. Adding the width of 3 and 4, back and front rail sleeves respectively, the overall footprint of the invention from the perspective demonstrated in FIG. 1 is 35 inches wide and 28 inches in depth. With this size footprint, the invention can be transported sideways through any doorway with a width of 28 inches or more. In the preferred embodiment, the incline ramp is made of 12 gauge AISI type 304 stainless steel or of a material with sufficient tensile strength and design to withstand the weight of two individuals within the confines of the above stated dimensions.

Back rail sleeves 3 and front rail sleeves 4 in the preferred embodiment are made of 1.75 inch outside diameter 0.065 inch wide type 304 stainless steel tubes. Back rail sleeves 3 are position onto the side of the incline ramp 1 such that the center of the tube is 23.65 inches from the front of incline ramp 1 and front rail sleeves 4 are position onto the side of incline ramp 1 such that the center of the tube is 8.65 inches from the front of incline ramp1. The top of both back and front rail sleeves are beveled at the preferred 18.96 degrees such that the top surface of the sleeves are flush with the surface of the incline ramp. Front rail sleeves 4 have a retaining pin hole 9 of 0.25 inches in diameter centered in the middle of the sleeve and situated 2 inches from the bottom of the sleeve.

FIG. 2 is a perspective view to illustrate different embodiments of the rail 2 of the present invention. In the preferred embodiment, the rails are made of 1.5 inch outside diameter schedule 10 stainless steel tubing for strength and to facilitate stability for user's weight bearing. The 1.5 inch diameter is the preferred dimension for handicapped bar rails thereby enabling easy gripping which is an important factor for individuals with arthritis in their upper extremities or hands. The back upright rail support 12 rises to a height of 35.19 inches and incorporates a bend to receive the uppermost horizontal rail support. The front upright rail support 13 rises to a height 35.19 inches and incorporates a bend to receive the protruding configuration of the rail 14 that has a height dimension of 10.5 inches before aligning with the uppermost horizontal rail support. The center of the horizontal cross rail support 11 is attached 22 inches from the bottom of the rail 2 to strengthen the overall design and offer a second grasping area when situating the rails on either side of the ramp either in a forward or reversed configuration. Upright rail supports 12 and 13 have retaining pin hole 9 of 0.25 inches in diameter centered in the middle of the tube to correspond with the retaining pin holes in the front rail sleeves. With the retaining pin in place, the rails cannot be displaced or dislodged from the rail sleeves.

FIG. 3 is a perspective view of the front rail sleeves 4 with a rail 2 in place and a retaining pin 5 in place that is .025 inches in diameter by 1.25 inches in length with a ring grip for ease of placement or removal. Sleeve shelf 8 is 0.25 inches in thickness with an inside diameter of 1.25 inches and situated flush with the bottom surface of the rail sleeves to prevent the rails from sliding through the rail sleeve but providing a wide enough opening to cleanse the inside of the rail sleeve.

FIG. 4 is a perspective view of the left side of the incline ramp 1 with associated rail sleeves 3 and 4 and the foot actuation mechanism 7 depicted in the

depressed mode that vertically lowers one pair of swivel casters thereby raising one side of the incline ramp off a floor surface. Foot actuation mechanism 7 raises or lowers a caster plate with attached casters via a straight-line action clamp of Des-ta-co model type 606-M having a plunger depth of 1.5 inches and a holding capacity of 450 pounds. Both of the foot pedals, one on either side of the incline ramp that is illustrated in FIG.1, must be depressed fully to raise the incline ramp thus lowering the wheels fully for transportation. It is preferred that one or both rails are used to push the invention in forwardly thus avoiding a twisting back motion if the invention is pulled by the user. A rubber type furniture glide 10 that is 0.25 inches in height and 0.375 inches in diameter is embedded on each corner of the incline ramp to resolve issues of an uneven floor surface.

FIG. 5 is a perspective enlargement view of the sleeve shelves 8, the foot actuation mechanism 7, the sleeves and the outside of the caster plate 15 that is in the preferred embodiment made of 12 gauge steel to accommodate the straight-line action clamp and the associated double ball bearing 3 inch hospital bed type swivels with a 0.44 inch diameter by 1.44 long friction grip stem. The caster plate 15 having an overall dimension of 26.5 inches of width, 16.5 inches in depth and 1.75 inches in height takes on the appearance of an upside down hat with the rectangular bowl of the hat portion being 8 inches across and inset 3.5 inches from the outside edges. A 1 inch by 1 inch by 1.375 inch steel bar with a 0.438 diameter hole is inset in each corner of the caster plate to accommodate the caster stems. These caster stem holders are positioned 6.75 inches from the center of the caster plate and inset 2.06 inches from each lateral edge of the of the caster plate. A straight-action plunger situated vertically is fixed to each respective inside of the incline ramp 17.9 inches from the front of the ramp with the plunger mechanism correspondently being bolted through the center of the caster plate. The caster plate 15, holding the

wheels, that raises and lowers offers rigidity to the teeter-totter motion of the incline ramp when each foot pedal is depressed downwardly or released upwardly via a users foot.

As noted above, preferably, the incline ramp incorporating the rail sleeves, in accordance with the invention, is made of steel or of a material that is substantial enough to withstand the weight tolerances of two human beings and the surface is preferably covered with a non-skid material that will tolerate hospital disinfecting solutions to prevent slippage of a user and assisting individual. As also noted above, preferably the rails are made of stainless steel or of a material that is substantial enough to withstand the full weight bearing of a single human being.

In accordance with the invention, a device of self-help support for aiding a user to change location or elevation has been described which fully meets the objects and advantages set forth above. Although the portable ambulatory rail ramp system has been described and illustrated by reference to specific embodiments, it is not intended that the invention be limited to the specified embodiments thereof. Those skilled in the art will recognize that variations and modifications are possible such as the rail ramp system may have other dimensions and be fabricated of different materials. The rails may take on a different dimension and configuration and be fabricated of different materials but still embodies substantial support for an individual's body weight. The wheels and foot actuation mechanism may take on a different design and configuration such as an electronically controlled track assembly but still embodies portability. Accordingly, it is intended to include within this invention all such variations and modifications that fall within the scope of the appended claims.